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~ USAF Records Are Lost! ~

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Microsoft has announced that the next expansion for Halo 5:

Guardians called Warzone Firefight will arrive on June 29 and gamers will be able to play it for free until July 5.

Halo 5: Guardians is a first-person shooter video game developed by 343 Industries and published by Microsoft Studios. The game was released in October 2015 for Microsoft Xbox One.

The game developer released the first DLC called Battle of Shadow and Light in November 2015 and Warzone Firefight is the eighth expansion pack for the game.

The first expansion for Halo 5 was Battle of Shadow and Light, which was released in November 2015. A month later Cartographer's Gift, and in January 2016 Infinity's Armory was released. It was followed by Hammer Storm in February and Ghosts of Meridian in March. Memories of Reach and Hog Wild both rolled out in May.

Warzone Firefight is by far the biggest post-release content for Halo 5 and on June 23, Microsoft announced that the expansion will be available on June 29.

"To celebrate the release of Warzone Firefight next week, the full game of Halo 5: Guardians will be available to download and play FOR FREE to all Xbox Live Gold members from June 29 to July 5 as part of Xbox Live's 'Free Play Days' program. Additionally, Halo 5: Guardians will be on sale for 50 percent off during this same time. There's no better time to join the Spartan ranks!" says an Xbox blog post.

The game developer released the beta version of Warzone Firefight in April. Microsoft suggests that 343 Industries has taken feedback from players to improve various aspects of the expansion before the official launch.

Gamers will have to fight a new boss called Grunt Goblin in the upcoming expansion. The DLC will also bring three new multiplayer maps, including two for Warzone (Prospect and Attack on Sanctum) and one for Arena (Molten).

The expansion also includes REQ items such as new armor sets, weapons and vehicle variants. The game developer is also bringing a Score Attack mode to Campaign.

"We're big fans of scoring in past Halo games, and we wanted to bring it back to Halo 5: Guardians, but with a few new twists. We call it: Score Attack," says Gabe Deyerle, campaign engineer at 343 Industries, in an interview with Halo Waypoint. "With over 50 medals to earn in Score Attack, you'll earn the most points for defeating your foes as stylishly as possible."

343 Industries will announce more surprises about the upcoming expansion during the pre-release live stream on June 28, which will start at 2 p.m. PDT on the game's Twitch channel.

names in the video game industry, often being called the Father of Mega Man. After departing Capcom in 2010, he started his own development company with Comcept and held a very successful Kickstarter campaign for a spiritual successor to the Mega Man franchise, which after a very arduous development process that saw many delays has finally arrived with Mighty No. 9.

Set sometime in the indeterminate future, in which there are 52 states, Mighty No. 9 follows a very similar premise where a robotics designer named Dr. White has created a roster of androids known as Mighty Numbers, of which the protagonist Beck is the ninth. The other eight have gone rogue due to being assimilated by outside forces and Beck's mission is to free them all, which is a nice little change from most of the Mega Man franchise, though most of the story cues feel all too familiar.

The actual gameplay itself is pretty standard from what you expect from an Inafune title. You will face an intro stage, followed by eight Mighty Number stages and then a few final stages. Each of these levels features side-scrolling platforming, which does a solid job at providing players a style of game that has been missing the last few years. The levels all feature different elemental themes and obstacles, though some can get a little overused between multiple stages. The designs themselves are somewhat hit and miss, though stages like Highway and Capitol Building are standouts in their setup.

Beck himself has an arsenal of weapons at his disposal by the end of the game, but at the start he has but a few. He comes equipped with an arm cannon that you can continuously fire by tapping the attack button, though you cannot charge it at all. Dashing is part of his moveset from the outset as well, which has use beyond just being used to jump across gaps.

One aspect of the game that is completely original is that all of the robots in the game are made up of what are known as Xels, which are absolutely vital to the gameplay. Rather than just straight up shooting every enemy with your weapons and it dying rather quickly, it takes much longer to outright kill them. Instead, after a few hits, they will start to glow a certain color, which means you can dash with R1 and absorb the Xels from these enemies, which helps to restore your weapon meter depending on how quickly you do so.

The Xel system sounds quite intriguing on the surface, but the manner in which it is executed in the game is far from perfect. Just how close you have to be to a glowing robot seems to differ throughout the game, with the preciseness being a problem. The fact you have to dash into the creature is fine as it wipes them out, but when you're fighting more than one and don't have the ability to shoot through the first one, you will find yourself getting damaged through dashing, as the dashing leaves you vulnerable. The Xel system definitely has a good bit of potential, but it can wear out its welcome pretty quickly in just how much it is used.

This is not to mean that the gameplay isn't fun, as it really can be, especially when you get to the boss battles. At the end of each of the main stages, you will face one of the Mighty Numbers, each with a completely different style boss fight. The first one you choose will have to be defeated with just your arm cannon, but in

exactly the same way as its spiritual predecessor, Beck will absorb the abilities of his defeated and now saved friends. These can then be used throughout the stages themselves, being replenished by absorbing Xels, and are more useful against specific bosses, including some of the end bosses.

After collecting these new weapons, the game will actually advise you on which level to tackle next by adding an Advice option below that level, which does take away some of the mystery that players had with trying to guess elemental weaknesses in the past. However, now it is spelled out completely. The levels themselves can be kind of tricky difficulty wise, but the non-boss enemies should be a cake walk throughout. Luckily, for those looking for more of a challenge, the game does offer a higher difficulty level option.

After completing the eight Mighty Numbers, the end is near as you open up a few new stages, of which one is based on Beck's female counterpart Call that was previously found only in the cutscenes. She plays a little differently from Beck, as she cannot absorb Xel, but rather can hover in air and create an energy bubble that protects her. The Call stage one of the stretch goals in the Kickstarter campaign, so it's great to see it included, but it feels totally misplaced by making it a requirement to unlock the final stage with these changes in the gameplay mechanics that are more stealth based, to then go right back to Beck.

Rather than going with 8-bit graphics, such as with the more recent Shovel Knight, Comcept and Inti Creates forgoes this for a more modern style that combines 2D and 3D animation. You have been done well in countless games over the years, but in Mighty No. 9 it is just downright plain looking. The backgrounds are mostly uninspired throughout, with many repetitive locations within each stage that really do not stand out at all, though Highway does stand out above the rest. Other side-scrollers in recent years like Donkey Kong Country: Tropical Freeze offer astounding backgrounds, while the ones here just feel dull and completely forgettable. The characters' models are also merely okay, though some of the actual designs themselves are definitely vintage Inafune.

Having a rocking score can often help offset lackluster visuals, but the background music found in Mighty No. 9 is far from memorable as well. The stage tracks all blur together for the most part, with none of them really leaving any sort of lasting impressions. The voice acting isn't really any better either, though it does somewhat capture a little of that campy vibe that it appears they were going for.

One of the issues that caused a few different delays for Mighty No. 9 was said to be the online play and as of this time, it has still be near impossible to find a match. These challenge races match you up with someone else, but the problem is that to even unlock this game mode, you have to have defeated all eight of the Mighty Numbers. This is something that not many have done just after release, severely limiting the pool of players that can participate and making matchmaking a big problem.

Mighty No. 9 takes the spiritual successor title to heart by offering a near copy of many elements of the Mega Man franchise

and injecting it with a few unique ideas. Even with dull visuals and a little too much reliance on the past, in a world where Capcom has seemingly forgotten that the Blue Bomber exists, Mighty No. 9's enthralling boss battles make it an okay substitute to fill that void for the time being.

This TV Commercial For 'Super Mario 64' Is Super '90s

Video games, and video game advertising, have come a long way in 20 years. When Nintendo's N64 console launched 20 years ago in Japan, it marked the beginning of a revolution.

Nintendo's 1996 machine would see countless classics released for it, with one of the most notable being the 3D platforming perfection of Super Mario 64. It was one of the first of its kind and gaming would never be the same.

The N64 was released in Japan in June 1996, but it wouldn't be until September that the console would arrive in the United States. When it did, it was accompanied by some of the most '90s TV advertisements the industry has ever seen.

It lets the product speak for itself. Sure, there's nothing particularly flashy about it, but it lets the game and the console do the talking.

And here's what the commercial American audiences received, which is mostly focused on being as "cool" as possible. Why is it necessary to insert a random kid into the action of Super Mario 64? To show how real it is maybe? The world may never know. The world may also never know who is responsible for writing the commercial's laughably bad script.

"What am I, a monkey?" exclaims the kid at one point while climbing monkey bars behind Mario. While it may have worked at the time (maybe?), going back and watching the ad today is a serious blast from the past, and not in a good way.

Advertisements for the 1996 holiday season didn't fare much better. Instead of putting an emphasis on the new hardware or all the cool new games, the commercial invents a cheesy Christmas jingle about kids bummed out about their non-Nintendo 64-related gifts.

Of course, this is far from the only two examples of Nintendo's strange U.S. advertisements over the years. The 1998 release of Pokémon Red and Blue in the United States also saw a number of bizarre ads, most notably this one that sees a bus full of cute and innocent Pokémon smashed by a trash compactor. Nintendo's ads have truly come a long way.

See more at: <http://www.techtimes.com/articles/166911/20160624/this-tv-commercial-for-super-mario-64-is-super-90s.htm#sthash.05Xz2D8N.dpuf>

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->A-ONE Gaming Online      -          Online Users Growl & Purr!
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RZA and Atari Team Up for Classic Video Game Inspired New Album

Classic video game brand Atari and hip-hop star RZA are teaming up for a new video game inspired album.

"Atari, one of the world's most recognized publishers and producers of interactive entertainment, today announced a co-production agreement with award-winning, hip-hop legend RZA," the company noted in a press release Friday.

"The partnership will serve as a platform to create new music based and inspired by the sounds and music in Atari's vast collection of games."

"I'm so excited to work on these iconic games to deliver what I believe will be one of my best albums," said the Wu-Tang Clan member and noted gamer. "I am going to invite some of my friends to join me and it will be Game On with the first beat!"

"RZA is a multi-talented artist and soundtrack virtuoso and we cannot wait to hear the new tracks he creates based on Atari's iconic video game sounds and music," added Atari chief executive office Fred Chesnais.

Atari, a pioneer in creating arcade games and home consoles, is most known for helping to define the video game industry in the 1970s and 1980s with iconic releases such as Pong, Asteroids, Centipede and many more.

RZA and his legendary hip-hop group the Wu-Tang clan last made headlines in November of 2015 when they auctioned off a one-of-a-kind, secret 31-track album entitled Once Upon A Time In Shaolin for millions.

Fans of the rap collective became enraged after it was discovered that former controversial Turing Pharmaceuticals CEO Martin Shkreli was revealed as the buyer. Known as one of the most despised men in America for raising the price of Daraprim, a drug used to treat AIDS and cancer patients from \$13.50 to \$750 a pill, Shkreli teased fans about playing songs from the album online but never did.

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A-ONE's Headline News
The Latest in Computer Technology News
Compiled by: Dana P. Jacobson

Judge Says The FBI Can Hack Your Computer Without A Warrant

The FBI did not need a warrant to hack a US citizen's computer, according to a ruling handed down on Tuesday by Senior US District Court Judge Henry Coke Morgan, Jr. If the decision is upheld, it may have ripple effects that essentially allow government agencies to remotely search and seize information from any computer in the US without a warrant, probable cause or suspicion, the EFF argues.

The ruling relates to a worldwide FBI sting dubbed Operation Pacifier that targeted child pornography sites on anonymity networks such as Tor. The FBI deployed hacking tools across computers in the US, Chile, Denmark and Greece, and caught 1,500 pedophiles on the Dark Web. As part of Operation Pacifier, authorities briefly seized and continued running a server that hosted the child pornography site Playpen, meanwhile deploying a hacking tool known internally as a network investigative technique. The NIT collected roughly 1,500 IP addresses of visitors to the site.

Judge Morgan, Jr. wrote on Tuesday that the FBI's actions did not violate the Fourth Amendment, which protects US citizens from unreasonable search and seizure. "The Court finds that no Fourth Amendment violation occurred here because the government did not need a warrant to capture Defendant's IP address" and other information from the suspect's computer, he wrote.

"Generally, one has no reasonable expectation of privacy in an IP address when using the internet," Morgan, Jr. said. "Even an internet user who employs the Tor network in an attempt to mask his or her IP address lacks a reasonable expectation of privacy in his or her IP address."

Basically, the judge argued, computers are hacked every day and no one should expect privacy while operating online.

"The rise of computer hacking via the internet has changed the public's reasonable expectations of privacy," he wrote. "Now, it seems unreasonable to think that a computer connected to the web is immune from invasion. Indeed, the opposite holds true: In today's digital world, it appears to be a virtual certainty that computers accessing the internet can - and eventually will - be hacked."

A Massachusetts court previously threw out evidence gathered by the FBI in one Playpen case, ruling that the operation relied on an invalid warrant. The bureau has moved to keep its NIT software classified, citing national security concerns if it were made public.

In April, the Supreme Court upheld the FBI's proposed changes to Rule 41, allowing judges to approve remote access to suspects' computers that fall outside their jurisdiction. Under the new rules, a judge in New York can authorize hacking a computer in Alaska, for example. A bipartisan Senate bill called the Stop Mass Hacking Act aims to block these expanded powers. There's a similar

bill making its way through the House of Representatives, as well, according to Reuters. Congress has until December 1st to reject or amend the Supreme Court's ruling - if it doesn't, the changes to Rule 41 will take effect as planned.

Hackers Find Over 100 Bugs in U.S. Defense Systems

The "Hack the Pentagon" bug bounty program by the United States Department of Defense (DoD) has been successful with more than 100 vulnerabilities uncovered by white hat hackers in Pentagon infrastructure.

In March, the Defense Department launched what it calls "the first cyber Bug Bounty Program in the history of the federal government," inviting hackers to take up the challenge of finding bugs in its networks and public faced websites that are registered under DoD.

Around 1,400 whitehat (ethical) hackers participated in the Hack the Pentagon program and were awarded up to \$15,000 for disclosures of the most destructive vulnerabilities in DoDs networks, Defense Secretary Ashton Carter said at a technology forum on Friday.

"They are helping us to be more secure at a fraction of the cost," Carter said. "And in a way that enlists the brilliance of the white hatters, rather than waits to learn the lessons of the black hatters."

The Hack the Pentagon program, hosted on bug bounty platform HackerOne, was opened between April 18 and May 12, 2016. All participants were required to qualify a background check.

Although hackers and bug hunters were permitted to hack the agency's web properties, critical and highly sensitive systems of the Pentagon were out of bounds for the bounty program.

When the Hack the Pentagon was initially announced in March, Carter said he believed this effort would "strengthen our digital defenses and ultimately enhance our national security." And yes, it did.

Computer Crash Wipes Out Years of Air Force Investigation Records

Fraud and abuse investigations dating back to 2004 vanished when a database became corrupted, service officials said.

The U.S. Air Force has lost records concerning 100,000 investigations into everything from workplace disputes to fraud.

A database that hosts files from the Air Force's inspector general and legislative liaison divisions became corrupted last month, destroying data created between 2004 and now, service officials said. Neither the Air Force nor Lockheed Martin, the defense firm

that runs the database, could say why it became corrupted or whether they ll be able to recover the information.

Lockheed tried to recover the information for two weeks before notifying the Air Force, according to a service statement.

The Air Force has begun asking for assistance from cybersecurity professionals at the Pentagon as well as from private contractors.

We ve kind of exhausted everything we can to recover within [the Air Force] and now we re going to outside experts to see if they can help, said Ann Stefanek, an Air Force spokeswoman at the Pentagon.

For now, Air Force officials don t believe the crash was caused intentionally.

[W]e re doing our due diligence and checking out all avenues within the investigation to find out if there s anything that we re not aware of, Stefanek said. Right now, we don t have any indication of that.

Lockheed declined to answer specific questions about the incident.

We are aware of the data corruption issue in the Air Force s Automated Case Tracking System (ACTS) and are working with the Air Force to identify the cause, and restore the lost data, Maureen Schumann, a company spokeswoman, said in an email.

The Air Force inspector general is an independent organization that reports directly to Air Force Secretary Deborah Lee James and Gen. Mark Welsh, the Air Force chief of staff. The office investigates claims of waste, fraud, and abuse within the service.

Stefanek said the ACTS system contains all sorts of personal information, such as complaints, the findings of an investigation, and any actions taken. The database also contains records of congressional and constituent inquiries.

The data lost dates back to 2004.

[W]hen the system crashed, all those historical records were lost, she said.

Data about current investigations has also been lost, which is delaying them.

The Air Force is assessing the immediate impact of the data loss, but at this time we are experiencing significant delays in the processing of inspector general and congressional constituency inquiries, the service said in a statement.

It s possible that some data is backed up at local bases where investigations originated.

We ve opened an investigation to try to find out what s going on, but right now, we just don t know, Stefanek said.

In a letter to Secretary James on Monday, Sen. Mark Warner, D-Va., said the lost database was intended to help the Air Force efficiently process and make decisions about serious issues like violations of law and policy, allegations or reprisal against whistleblowers, Freedom of Information Act requests, and Congressional inquiries.

My personal interest in the [Inspector General s] ability to make good decisions about the outcomes of cases, and to do so in a timely manner, stems from a case involving a Virginia constituent that took more than two years to be completed, flagrantly violating the 180-day statutory requirement for case disposition, Warner wrote.

The case Warner was referring to was conducted by the Defense Department s inspector general, but the senator said he is worried the Air Force s data loss could further delay investigations.

I am very concerned by any problems that could negatively impact case outcomes or that could exacerbate the already lengthy process for [inspector general] investigations to be concluded, he wrote.

He also criticized the Air Force for notifying Congress on Friday afternoon, five days after senior service leaders was told about the problem.

The five-sentence notification to Congress did not contain information that appeared to have the benefit of five days of working the issue, Warner wrote.

Air Force officials originally said information on sexual assaults might had been lost in the crash. After the article was published, they said that while sexual assault and harassment claims might have been part of the files lost, those types of investigations are backed up elsewhere. The inspector general does not investigate cases solely involving sexual assault. However, sexual assault or harassment might be tangentially part of an inspector general investigation, a service spokeswoman said.

Apple Is Laying The Groundwork To Kill Passwords

One of the small, overlooked Mac features Apple announced at WWDC last week also happens to be one of its most impressive.

With macOS Sierra, the new operating system coming to Mac in the fall, you can automatically log into your computer without typing your password as long as you re wearing your Apple Watch.

It s a great feature, but it also hints at a future when you won t have to worry about passwords for anything, not just logging into your Mac.

Here s how it works:

When you're logged into your iCloud account on both your Mac and Apple Watch, your Watch shares its location with Apple's servers. When you're within three meters or so of your Mac, iCloud tells your computer that it's safe to unlock without a password. Just open your MacBook or wiggle the mouse to wake it up and you're good to go.

Why is that safe? It's because you have to unlock your Apple Watch with a passcode when you put it on. The Apple Watch has sensors on the bottom that can tell when it's on your wrist, so you'll remain authenticated as long as you keep wearing it. That's why you don't have to type in your passcode every time you want to use Apple Pay or check a notification on the Apple Watch, for example.

There's another hint that Apple is thinking about this with Apple Pay on the web. Soon, websites can add Apple Pay as an option at checkout. When you click to pay, you can authenticate the payment with your Apple Watch or fingerprint on your iPhone.

You can see this as a first step towards a future where we never have to worry about passwords again. Imagine extending Apple's login system to other apps and websites you visit on your Mac or iPhone. As long as you're wearing your Apple Watch, you can theoretically log into anything, assuming the developer supports it.

Other companies are already experimenting with similar login methods to eliminate passwords. Google is working on something called Project Abacus that'll let you authenticate logins with the fingerprint sensor on your Android phone. And a startup called Nymi is working on a wristband that authenticates your logins using your unique heartbeat.

Apple already makes one of the most popular wearable gadgets in the world, so it's in a better position than most to unlock the Watch's potential as a way to eliminate manually-entered passwords.

What Is The Internet of Things?

The Internet of Things is a pretty annoying term, as buzzwords go. There is no new Internet made up of objects. There's no little Twitter for thermostats, or Facebook for waffle irons.

Internet of Things refers to everyday appliances that are now networkable: Lights. Thermostats. Coffee makers. Security cameras. Door locks. Sprinklers. Robot vacuums. Usually it just means you can control them from your phone.

(There's also an explosion of IoT interest in industrial and commercial buildings, and that's a totally different ball game. Those uses allow alarm systems, heating/cooling, lighting, and all kinds of sensors to communicate intelligently, both with each other and with building managers, for a huge boost in convenience, savings, and environmental payoff. But in this article and video, we're talking about the consumer Internet of

Things things stuff in your home.)

Some of these consumer things make sense. The thermostat is handy; the Nest thermostat programs itself by observing what time you come and go, and the Honeywell Lyric uses your phone's GPS to know when you're approaching the house, and get it heated or cooled in advance. OK.

But most of the IoT is just like a gold rush to sell stuff. There's an IoT water bottle, an IoT doggie-treat dispenser, and an IoT toilet-paper holder (lets your phone know when the roll needs replacing). There's an IoT umbrella, an IoT fork, an IoT toothbrush, an IoT trash can, and I am not making this up an IoT tampon.

And don't forget the Egg Minder. I kid you not: now, from anywhere in the world, you can see HOW MANY EGGS YOU HAVE LEFT. This is a real, shipping product.

So far, the Internet of Things is more like the Internet of Things that Aren't Selling Well. That's partly because they're complicated to set up, partly because they're just not that necessary, and partly because you need a different app for every single product! One app for the lights, a different one for the thermostat, a third for the coffee maker.

Every big company is trying to create a unified standard Apple, Microsoft, Google, Intel but that just means that there are now 40 unified standards!

So clearly, this is like the Commodore 64 era of the Internet of Things: a lot of heat, very little light.

The security cameras and thermostats make sense; most of the rest of it, you can safely ignore. But that's the way it always is with new tech developments, right? Everybody throws everything at the wall, and a few things might stick. A few years from now, we'll have figured out which consumer items actually need to be networked.

You know how we now understand phone to mean cellphone, TV to mean HDTV, and refrigerator to mean refrigerator/freezer? In the same way, the term Internet of Things will eventually fade away. It will be unnecessary; we'll just assume that anything that deserves to be networkable is networkable.

The FCC Will Start To Make 5G A Reality This Week

For years we've been hearing that super-fast 5G wireless is on the way. This week, the Federal Communications Commission will start to make that happen.

On Thursday, FCC Chairman Tom Wheeler will circulate a proposal to kick off 5G wireless proceedings. If passed, the commission will begin to identify and open up swaths of high-band spectrum, which is capable of delivering data at much higher speeds than

what's currently used for 4G and LTE.

"The US could be "the first country in the world to open up high-band spectrum for 5G""

"If the Commission approves my proposal next month, the United States will be the first country in the world to open up high-band spectrum for 5G networks and applications," Wheeler intends to say in a speech this afternoon. "And that s damn important because it means US companies will be first out of the gate."

Wheeler wants to be very clear that the FCC is not defining 5G. In fact, there's still no 5G standard. As Wheeler puts it, "If anyone tells you they know the details of what 5G will deliver, walk the other way."

So what exactly is the FCC's plan? Wheeler basically wants to leave it up to the market, as the commission did for 4G before it. The commission will open up a bunch of new wireless spectrum which is what companies like AT&T and Verizon use to beam data from their towers to your cellphones and then leave phone companies and other competitors to do what they'd like with it. The commission is pretty sure it'll all work out.

"Unlike some countries, we do not believe we should spend the next couple of years studying what 5G should be, how it should operate, and how to allocate spectrum, based on those assumptions," Wheeler's prepared remarks say. "...Instead, we will make ample spectrum available and then rely on a private sector-led process for producing technical standards best suited for those frequencies and use cases."

"Wheeler envisions speeds of 10 to 100 times current wireless"

Even though the FCC won't formally define 5G, Wheeler is putting out his own ideas for what it should be able to offer. Broadly speaking: far faster speeds. He says 5G should be "like mobile fiber," offering speeds 10 to 100 times faster than what mobile offers today.

Wheeler also calls for increased responsiveness, so that commands can be issued in less than one millisecond. That's critical, he says, for applications like remote surgery: "The surgeon s scalpel needs to be immediately responsive, not a blink later."

The proposal would also open up a large amount of high-speed unlicensed spectrum. Whereas most of the new 5G spectrum will be leased out to wealthy companies, this unlicensed area will be open to use by anyone. That's essentially what Wi-Fi is so you can imagine this proposal also leading to much faster Wi-Fi speeds than what we get today.

"There are major hurdles that 5G will have to overcome"

As exciting as 5G is, it comes with some major technical hurdles. Signals for 5G won't be able to travel very far and won't be great at penetrating buildings. That means they'll require extensive cell tower deployment which will be time consuming and expensive. New technologies will also be needed to

let mobile devices keep track of 5G signals, which may need to be steered and aimed, rather than blanketing an area the way traditional wireless technologies have.

Some work has already started on all of this. Verizon recently began 5G tests, and AT&T intends to begin outdoor 5G tests over the summer. We've also seen 5G work from Google, Samsung, and a startup called Starry. This is all necessary to make 5G actually happen. They're the ones that'll have to overcome 5G's limitations and hopefully eventually land on a standard that'll make devices interoperable.

That's all still a few years out, at the earliest. But this week's actions by the FCC signal that it's moving toward reality. The commission will vote on Wheeler's proposal at a meeting next month. If it passes and it likely will the commission will then move toward opening up spectrum. That process, which will be called the Spectrum Frontiers proceeding, could also take several years. But Wheeler notes that the first 5G deployments are expected to be ready for 2020. And he doesn't seem to want the FCC to be the one holding that up.

Using Edge Instead of Chrome Will Add Hours of Extra Battery Life

It's no big secret that Google's Chrome browser is a bit of a battery hog. The native browsers on both Windows and macOS (Edge and Safari) are widely reported to outlast Google's offering. In its latest campaign, Microsoft is quantifying this difference: in a test that cycles through some common sites including Facebook, YouTube, Wikipedia, and Amazon, Microsoft's latest browser lasted 7 hours and 22 minutes on a Surface Book system. Chrome lasted just 4 hours and 19 minutes.

Between these extremes were Firefox, at 5 hours and 9 minutes, and Opera in battery-saving mode, at 6 hours and 18 minutes.

Microsoft has gone a step beyond just measuring how long each system runs by measuring the power draw of the Wi-Fi, CPU, and GPU during its test workload. A task that drew 2.1W in Edge pulled 2.8W in Chrome, 3.1W in Opera, and 3.2W in Firefox. This lower draw translates to the longer battery life.

The Windows 10 Anniversary update is making further changes to improve Edge's power efficiency. Some of these tweaks are surprisingly small for example, changing how certain animations are performed in the toolbar to allow greater offloading to the GPU whereas others are larger.

Flash content that is not deemed to be central to a page's content will become click-to-play, which is something that other browsers also do. Background tabs will also use fewer resources by making their JavaScript timers fire less frequently and by using coalescing to ensure that they all fire together and hence reduce the number of times that the processor must be woken up. This shouldn't interfere with listening to music or, say, checking for mail in a background tab, but it should reduce the overhead due to spurious animations and so on.

Microsoft is also making some networking changes in Edge and the Anniversary update to speed up the initial connection to a server and to allow larger data packets to be used sooner. Edge will also more aggressively re-request data that appears to be timing out. These changes mean that the Wi-Fi connection can be put into low power mode more aggressively.

Edge's rendering engine does a good job of showing pages, and aspects like the power consumption are certainly desirable for mobile users. But in spite of these changes, many of us will continue to use Chrome. Edge is currently deeply feature-deficient when compared to Chrome, Firefox, and Opera. The Anniversary update takes some important steps toward rectifying the problem, with pinned tabs and support for extensions. These types of steps help Edge move toward being a practical day-to-day browser.

For mobile users, at least, Edge will be well worth checking out. If Microsoft's figures are representative of normal Web usage and they certainly reflect our own experiences then there are enormous gains to be had from using Edge instead of Chrome or Firefox. With Edge going some way toward filling the feature gap and having a substantial lead in power efficiency, it's going to keep you browsing for much longer than the alternatives.

Microsoft Tweaks Activation Rules for The Windows 10 Anniversary Update

Microsoft this week announced a seemingly minor change to its activation rules for Windows 10, effective with the Anniversary Update coming this summer.

The announcement was buried in the release notes for build 14371 of Windows 10, released a few days ago. Those notes were published in the Feedback Hub, which is available only to registered members of the Windows Insider Program running a Windows 10 preview edition.

As with all things that are related to licensing, the details are confusing and it's easy for even longtime Windows watchers to draw the wrong conclusions or to dream up conspiracy theories.

Here's the short version: Beginning with the Anniversary Update, version 1607, you'll be able to link a Windows 10 digital license with a Microsoft account. This linkage occurs automatically if you're signed in with a Microsoft account when you upgrade to version 1607.

For anyone else, including those with local or domain accounts, this step is optional. In any case, it applies only to those who have a Windows 10 digital license. That group consists primarily of those who took advantage of the year-long free upgrade offer that ends on July 29, 2016.

This new feature doesn't change the fundamental way that Microsoft's activation servers work. The process of activating Windows relies on a unique installation ID, which is based on a

hash of information taken from the hardware on which Windows is installed. That hash is reportedly not reversible and is not tied to any other Microsoft services. It identifies a specific device, not a person.

When you use a product key to activate Windows for the first time, that installation ID is recorded in the activation database alongside the product key you entered with the installation. Later, if you need to reinstall the same edition of Windows on the same hardware, with the same product key, activation happens automatically. (Conversely, if you try to use that product key on a different machine with a different hardware ID, you'll probably be denied activation.)

But those free Windows 10 upgrades don't use a product key, so they require a different way to store the details of each upgrade license on the activation servers.

During an upgrade, the Windows 10 setup program confirms that the underlying copy of Windows 7 or Windows 8.1 is properly activated. During the free upgrade period, the Windows activation servers used that confirmation to generate a Windows 10 digital license (during the upgrade period, Microsoft referred to this as a "digital entitlement"). That digital license is stored in the activation database with your hardware-based installation ID and details about the version you just activated (Home or Pro).

If you wipe that hard disk completely, boot from Windows 10 installation media, and install a clean copy, Windows tries to activate automatically, using an installation ID that it sends to the Windows activation servers. Because the underlying hardware hasn't changed, the installation ID is identical to one stored in the activation database, and the digital license is activated automatically.

For most PCs, most of the time, that process just works.

But there are two situations in which reactivation can stumble.

First, if you make major hardware changes. The algorithm that generates the installation ID is a closely guarded secret, but I can confirm from years of testing that it is extremely tolerant of minor changes. If you add a hard drive, upgrade a video card, or increase memory, you almost certainly won't trigger a change in the installation ID.

Changing the motherboard, however, generates a new installation ID. Under Microsoft's sometimes Byzantine licensing rules, your license is valid if you replace a motherboard because of hardware failure. You need a new license if you chose to upgrade the motherboard, because you're essentially building a new PC.

Under the existing rules, there's no way to prove that you have a digital license for that PC. You have to call the telephone activation line and plead your case with a support representative.

That's where linking the digital license to a Microsoft account comes in. After a motherboard replacement, you can use the new Activation Troubleshooter to view digital licenses associated with your Microsoft account and identify the device that has the

replacement motherboard. That action transfers the digital license to the new installation ID.

The second situation where the link to a Microsoft account might help is on a PC that has more than one license attached to it. That situation might apply if you purchased a PC with Windows 10 Home installed by the OEM and then upgraded to Windows 10 Pro during the free upgrade period using a product key from a retail copy of Windows 7 Professional, for example.

In that situation, a clean reinstall of Windows 10 from the manufacturer's recovery media might result in the Home version being installed and activated. The procedure for upgrading to Windows 10 Pro is far from obvious, involving generic product keys that aren't officially published. Here, too, being able to link that Windows 10 Pro license to a Microsoft account makes it possible to identify the correct digital license.

Microsoft says the new feature to link a digital license to a Microsoft account is in Windows 10 build 14371 or later. I have one PC that performed this connection automatically. I have not yet been able to test the manual linking process.

One concern that some will have is that linking installation IDs to a Microsoft account fundamentally changes the anonymity of activation. That's not likely to go over well with the contingent that believes Windows 10 telemetry is actually a secret spying program.

I am sure there will be additional conspiracy theories as well. In fact, I expect to read a few of them in the comments to this post.

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